

REMARKS

Claim Rejections - 35 USC §112

Claims 1-20 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

“The term "system" renders the claims indefinite. The term system can mean a variety of things including but not limited to both methods and apparatus. The claims appear to be written as apparatus or device but are argued as method (1-10) and apparatus (11-20) claims both using the term system. It is not clear which claims are intended to cover the method and which are to cover the apparatus. Clarification is required to determine the scope of the claims. Appropriate correction is required.”

While reserving all rights, in order to move prosecution along, Applicants have amended “system” claims, which include method steps to claim a “method”. The support for the amendment lies in the method steps and in Specification page 10, line 14. No new matter has been added and it is respectfully submitted that *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co. Ltd.*, 234 F.3d 588 (Fed. Cir. 2001) is not applicable to the amendments.

Claim Rejections - 35 USC §102

Claims 1-3, 5-8, and 10 are rejected under 35 U.S.C. §102(b) as being anticipated by Schmatz et al. (U.S. Patent No. 5,096,110, hereinafter “Schatz”).

Schatz discloses a control system and method of vacuum brazing of aluminum workpieces in a chamber wherein the combination of the partial pressure of water and the partial pressure of oxygen is adjusted to be within a determined desired combination pressure range as a function of the temperature within the chamber as the workpieces are heated up to a temperature of about 500° C.

With regard to claims 1 and 6, Applicants respectfully traverse the rejections since the Applicants’ claimed combination, as exemplified in claim 1, includes the limitation not disclosed in Schmatz of:

“replacing air around an unsoldered part with a first inert gas;
removing the first inert gas to form a vacuum around the unsoldered part;

vacuum reflow soldering the unsoldered part to form a reflow-soldered part;
providing a second inert gas to fill the vacuum around the reflow-soldered
part; and
replacing the second inert gas with air around the reflow-soldered part.”

The Examiner states in the first non-final Office Action of April 12, 2005 (hereinafter the “First Office Action”), repeats in the second non-final Office Action of October 4, 2005 (hereinafter the “Second Office Action”), and again repeats in the third non-final Office Action of March 15, 2006 (hereinafter the “Third Office Action”):

“Schmatz teaches a system for soldering a part comprising a means for replacing air around an unsoldered part with inert gas, means for replacing the gas with vacuum and means for backfilling the vacuum with gas and air which can be used for cooling. The gases are presumably the same (figure 1 and col 3 line 43 - col 4 line 8).”

Applicants respectfully disagree. It is respectfully submitted that Schmatz FIG. 1 and Schmatz col. 3, line 43, through col. 4, line 8, does not disclose using a vacuum or inert gas as claimed but instead discloses using a vacuum chamber to control the combination of partial pressures of oxygen and water while heating an object to brazing temperature:

“The system of the present invention further includes heating means, for controllably heating the workpieces within the vacuum chamber at a variable chosen heating rate, and pumping means for removing gases from the vacuum chamber.

...The processor means includes: ... (iv) adjustment means responsive to the control signal for adjusting the combination of the partial pressure of oxygen and the partial pressure of water in the chamber to correspond to an acceptable combination pressure as a function of the sensed temperature, comprising means for controlling the pumping means and the heating means. ...” [deletions and underlining for clarity]

Based on the above, it is respectfully submitted that claims 1 and 6 are allowable under 35 USC §102(e) as not being anticipated by Schmatz because:

“Anticipation requires the disclosure in a single prior art reference disclosure of each and every element of the claim under consideration.” W.L. Gore & Assocs. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983) (citing Soundsciber Corp. v. United States, 360 F.2d 954, 960, 148 USPQ 298, 301 (Ct. Cl.), *adopted*, 149 USPQ 640 (Ct. Cl. 1966)), *cert. denied*, 469 U.S. 851 (1984). Carella v. Starlight Archery, 804 F.2d 135, 138, 231 USPQ 644, 646 (Fed. Cir.), *modified on reh’g*, 1 USPQ 2d 1209 (Fed. Cir. 1986); RCA Corp. v. Applied Digital Data Sys., Inc., 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed. Cir. 1984).

Regarding claims 2-3 and 5, these dependent claims depend from independent claim 1 and are believed to be allowable since they contain all the limitations set forth in the independent claim from which they depend and claim additional unobvious combinations including: the first and second inert gases are the same gas; vacuum reflow soldering comprises heating around an integrated circuit package on a printed circuit board having solder paste printed thereon at a plurality of different temperatures in the vacuum; or moving an integrated circuit package on a printed circuit board in at least one direction of horizontally, vertically, and a combination thereof from replacing the air, removing the first inert gas, reflow soldering, providing the second inert gas, through replacing the second inert gas.

Regarding claims 7-8 and 10, these dependent claims depend from independent claim 6 and are believed to be allowable since they contain all the limitations set forth in the independent claim from which they depend and claim additional unobvious combinations including: vacuum reflow soldering provides the integrated circuit package on the printed circuit board having solder bumps with 90% of the solder bumps formed having less than 10% empty voids and 10% of the solder bumps having less than 20% empty voids as a percentage of volume; vacuum reflow soldering comprises heating around the integrated circuit package on the printed circuit board having solder paste printed thereon at a plurality of different temperatures in the vacuum; or moving the integrated circuit package on the printed circuit board in at least one direction of horizontal, vertical, and a combination thereof.

Based on all of the above, it is respectfully submitted that claims 1-3, 5-8 and 10 are allowable under 35 U.S.C. §102(b) as not being anticipated by Schmatz because:

“If the reference fails to teach or suggest even one limitation of the claimed invention, then the claim is not anticipated.” *Atlas Powder Co. v. E.I. du Pont De Nemours & Co.*, 750 F.2d 1569, 1574, 224 U.S.P.Q. 409, 411 (Fed. Cir. 1984).

Claims 1-20 are rejected under 35 U.S.C. §102(b) as being anticipated by Nishikawa et al. (U.S. Patent No. 6,227,436 B1, hereinafter "Nishikawa").

Nishikawa discloses soldering together two members after an oxide or contaminated layer has been removed from the surface of a solder material or bonding pad. The members are aligned in an oxidizing atmosphere. Then, the solder material is heated in a nonoxidizing atmosphere to melt the solder and bond the members. Cleaning of the solder material or bonding pad is performed by sputter-cleaning, laser cleaning, mechanical polishing, or cutting.

Regarding independent claims 1, 6, 11, and 16, Applicants respectfully traverse the rejections since the Applicants' claimed combination, as exemplified in claim 1, includes the limitations not disclosed in Nishikawa of:

"vacuum reflow soldering the unsoldered part to form a reflow-soldered part;
providing a second inert gas to fill the vacuum around the reflow-soldered part"

The Examiner states in the Third Office Action:

"Nishikawa teaches a system for soldering a part comprising a conveyor for moving the part, means for replacing air around an unsoldered part with inert gas (col 6 lines 15-45), means for replacing the gas with vacuum, means for replacing the vacuum with gas which can be used for cooling (col 8 lines 58-67), multiple lock chambers (col 8 lines 28-67, a vacuum reflow chamber and a pump for injection and removal of gas (figures 7 and 8, col 3 lines 44-65, col 9 lines 13 – col 9 line 24 and col 17 line 43 – col 18 line 32). The gases are presumably the same. As the soldering is performed in a vacuum, the apparatus is capable of forming solder bumps with very low void volumes. Although the reference teaches soldering of a circuit board, it is noted that the object soldered does not further limit the apparatus."

Applicants respectfully disagree. It is respectfully submitted that Nishikawa does not disclose the claimed vacuum reflow soldering in Nishikawa: col. 6, lines 15-45; col. 8, lines 58-67; col. 8, lines 28-67; FIGs. 7 and 8; col. 3, lines 44-65; col. 9, lines 13-24; or col. 17, line 43 through col. 18, line 32. Nishikawa actually states that the soldering is performed in a nonoxidizing atmosphere in Nishikawa col. 6, lines 7-14:

"By then heating the soldering material 2 in a nonoxidizing atmosphere, the soldering material is expanded to segment the thin film 6, thereby exposing clean surface portions as shown in FIG. 3(d). In this state,

soldering is performed without flux, resulting in the state shown in FIG. 3(e) in which the soldering material wets on a surface of a member 3 (which may be metallized) to be soldered, resulting in a desirable junction.” [underlining for clarity]

Based on the above, it is respectfully submitted that claims 1, 6, 11, and 16 are allowable under 35 U.S.C. §102(b) as not being anticipated by Nishikawa because:

“Anticipation requires the disclosure in a single prior art reference disclosure of each and every element of the claim under consideration.” W.L. Gore & Assocs. v. Garlock, Inc., supra.

Regarding claims 2-5, these dependent claims depend from independent claim 1 and are believed to be allowable since they contain all the limitations set forth in the independent claim from which they depend and claim additional unobvious combinations including:

- “the first and second inert gases are the same gas”;
- “vacuum reflow soldering comprises heating around an integrated circuit package on a printed circuit board having solder paste printed thereon at a plurality of different temperatures in the vacuum”;
- “removing the first inert gas includes simultaneously heating an integrated circuit package on a printed circuit board having solder paste printed thereon at a plurality of different temperatures and replacing the second inert gas includes simultaneously cooling the integrated circuit package on the printed circuit board having solder thereon at a plurality of different temperatures”; or
- “moving an integrated circuit package on a printed circuit board in at least one direction of horizontally, vertically, and a combination thereof from replacing the air, removing the first inert gas, reflow soldering, providing the second inert gas, through replacing the second inert gas.”

It is respectfully submitted that Nishikawa does not disclose the claimed inert gases before and after vacuum, vacuum soldering, removing, or moving in Nishikawa: col. 6, lines 15-45; col. 8, lines 58-67; col. 8, lines 28-67; FIGs. 7 and 8; col. 3, lines 44-65; col. 9, lines 13-24; or col. 17, line 43 through col. 18, line 32.

With regard to claim 7-10, these dependent claims depend from independent claims 6 and are believed to be allowable since they contain all the limitations set forth in the independent claims from which they depend and claim additional unobvious combinations including:

“vacuum reflow soldering provides the integrated circuit package on the printed circuit board having solder bumps with 90% of the solder bumps formed having less than 10% empty voids and 10% of the solder bumps having less than 20% empty voids as a percentage of volume”;

“vacuum reflow soldering comprises heating around an integrated circuit package on a printed circuit board having solder paste printed thereon at a plurality of different temperatures in the vacuum”;

“removing the first inert gas includes simultaneously heating the integrated circuit package on the printed circuit board having solder paste printed thereon at a plurality of different temperatures, and replacing the second inert gas includes simultaneously cooling the integrated circuit package on the printed circuit board having solder thereon at a plurality of different temperatures in the unloading unit after moving the integrated circuit package on the printed circuit board in the first move;” or

“moving the integrated circuit package on the printed circuit board in at least one direction of horizontal, vertical, and a combination thereof.”

It is respectfully submitted that Nishikawa does not disclose the claimed soldering with low voids, soldering at the plurality of different temperatures, removing the inert gases simultaneously with the heating or cooling at different temperatures, or moving printed circuit boards in Nishikawa: col. 6, lines 15-45; col. 8, lines 58-67; col. 8, lines 28-67; FIGs. 7 and 8; col. 3, lines 44-65; col. 9, lines 13-24; or col. 17, line 43 through col. 18, line 32.

With regard to claim 12-15, these dependent claims depend from independent claims 11 and are believed to be allowable since they contain all the limitations set forth in the independent claims from which they depend and claim additional unobvious combinations including:

“the loading and unloading locks have supplies of the first and second inert gases that are the same gas”;

“the reflow unit comprises a heating unit for heating at a plurality of different temperatures the unsoldered part in the vacuum;”

“the loading lock includes a pump for removing the first inert gas and a heating unit for simultaneously heating at a plurality of different temperatures the unsoldered part; and the unloading lock includes a supply of inert gas for replacing the second inert gas and a heating unit for simultaneously cooling at a plurality of different temperatures the reflow-soldered part;” or

“a conveyor system for moving the part among the loading lock, the reflow unit, and the unloading lock.”

It is respectfully submitted that Nishikawa does not disclose the claimed locks, vacuum reflow soldering, or the conveyor system for moving parts among a loading lock, a reflow unit, and the loading lock in Nishikawa: col. 6, lines 15-45; col. 8, lines 58-67; col. 8, lines 28-67; FIGs. 7 and 8; col. 3, lines 44-65; col. 9, lines 13-24; or col. 17, line 43 through col. 18, line 32.

With regard to claim 17-20, these dependent claims depend from independent claims 11 and are believed to be allowable since they contain all the limitations set forth in the independent claims from which they depend and claim additional unobvious combinations including:

“the reflow unit provides the integrated circuit package on the printed circuit board having solder bumps with 90% of the solder bumps formed having less than 10% empty voids and 10% of the solder bumps having less than 20% empty voids as a percentage of volume”;

“the reflow unit comprises a heating unit for heating the integrated circuit package on the printed circuit board having solder paste printed thereon at a plurality of different temperatures in the vacuum after moving the integrated circuit package on the printed circuit board from the loading lock”;

“a loading unit for providing an unsoldered integrated circuit package and an unsoldered printed circuit board to the loading lock, the loading lock [for heating at a plurality of different temperatures the integrated circuit package on the printed circuit board having solder paste printed thereon after moving the unsoldered integrated circuit package on the unsoldered printed circuit board from the loading unit, the unloading lock for cooling at a plurality of different temperatures the soldered integrated circuit package on the soldered printed circuit board in the unloading lock after moving the integrated circuit package on the printed circuit board from the loading lock, and an unloading unit for receiving a soldered integrated circuit package and soldered integrated circuit board from the unloading lock”;

“a conveyor system for moving in horizontal, vertical, and a combination thereof the integrated circuit package on the printed circuit board.”

It is respectfully submitted that Nishikawa does not disclose the claimed soldering with low voids, soldering at the plurality of different temperatures, removing the inert gases simultaneously with the heating or cooling at different temperatures, or moving printed circuit

boards in Nishikawa: col. 6, lines 15-45; col. 8, lines 58-67; col. 8, lines 28-67; FIGs. 7 and 8; col. 3, lines 44-65; col. 9, lines 13-24; or col. 17, line 43 through col. 18, line 32.

Based on the above, it is respectfully submitted that claims 1-20 are allowable under 35 U.S.C. §102(b) as not being anticipated by Nishikawa because:

“A claim is anticipated only if each and every element *as set forth in the claim* is found, either expressly or inherently described, in a single prior art reference. (Kalman v Kimberley Clark Corp., 713 Fed. 2nd 760, 771, 218 USPQ 781, 789 (Fed. Circ. 1983), *Cert. Denied*, 465 U.S. 1026, 224 USPQ 520, 1984.)”

Claims 1-20 are rejected under 35 U.S.C. §102(e) as being anticipated by Mitten et al. (U.S. Pub. No. 2003/0160088 A1, hereinafter “Mitten”).

Mitten discloses a vacuum heat treating furnace for brazing a large metallic part. A workpiece handling system is mounted on the pressure vessel door for supporting a metallic workpiece to be heat treated or brazed. The workpiece handling system includes apparatus for rotating the workpiece during a processing cycle. A vacuum system is connectable to the workpiece for creating a subatmospheric pressure inside the workpiece during a brazing cycle.

Regarding independent claims 1, 6, 11, and 16, Applicants respectfully traverse the rejections since the Applicants’ claimed combination, as exemplified in claim 1, includes the limitations not disclosed in Mitten of:

“replacing air around an unsoldered part with a first inert gas;
removing the first inert gas to form a vacuum around the unsoldered part;”

The Examiner states in the First and Third Office Actions:

“Mitten teaches a system for soldering a part comprising a conveyor for moving the part, means for replacing air around an unsoldered part with inert gas, means for replacing the gas with vacuum, means for replacing the vacuum with gas which can be used for cooling, multiple lock chambers, a vacuum reflow chamber and a pump for injection and removal of gas (figures 1 and 2, paragraphs 22-28, 31-35, 45 and 55-57). The gases are presumably the same. As the soldering is performed in a vacuum, the apparatus is capable of forming solder bumps with very low void volumes. Although the reference teaches soldering of a circuit board, it is noted that the object soldered does not further limit the apparatus.”

Applicants respectfully disagree. It is respectfully submitted that Mitten FIGs. 1 and 2 and paragraphs 23-25 and 29 does not disclose the claimed elements but instead discloses heating, vacuum, gas-injection, and forced gas cooling systems performing different functions:

[0023] The vacuum brazing furnace according to this invention also has a heating system. ... Heating of the workpiece in the hot zone is accomplished by direct radiation on the parts, by quiescent convection heating, and, when desired, by conduction heating through an inert gas atmosphere. ...

[0024] A process gas injection system is also provided for introducing an inert gas into the pressure vessel...

[0025] The heating, vacuum, gas-injection, and forced gas cooling systems are controlled by a programmable logic controller (PLC). ...

[0029] A furnace cooling system 70 is provided to cool the pressure vessel 12....”

Mitten paragraphs 55 and 56 disclose the functions performed by the Mitten elements described in paragraphs 23-25 above are to form a vacuum in the furnace, fill the furnace with inert gas, form a vacuum in the workpiece, fill the workpiece with inert gas, form a vacuum in the workpiece, and braze in the inert gas:

[0055] A typical sequence for operating the vacuum brazing furnace of this invention will now be described. ...The sealed pressure vessel 12 is then evacuated by the first vacuum pumping system 40. When the desired vacuum is reached, the pressure vessel 12 is backfilled with argon gas. The pressure vessel 12 is then evacuated again.

[0056] A vacuum is then drawn on the interior of the workpiece using the second vacuum pumping system 60. ... Argon gas is backfilled into the interior cavities of the workpiece, and then a second vacuum is drawn in the workpiece interior. ... Simultaneously, the vessel chamber is pressurized by the heating of the inert gas with occasional injection of additional argon gas as necessary. The temperature and pressure are continuously increased until the desired temperature and pressure conditions for brazing the workpiece W are reached. ...”

Based on all of the above, it is respectfully submitted that independent claims 1, 6, 11, and 16 are allowable under 35 U.S.C. §102(e) as not being anticipated by Mitten because:

“Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, *arranged as in the claim.*” [*emphasis added*] Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co. (730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984)(citing Connell v. Sears, Roebuck & Co., 722 F.2d 1542, 220 USPQ 193 (Fed Dir. 1983)))

Regarding claims 2-5, these dependent claims depend from independent claim 1 and are believed to be allowable since they contain all the limitations set forth in the independent claim from which they depend and claim additional unobvious combinations including: the first and second inert gases are the same gas; vacuum reflow soldering comprises heating around an integrated circuit package on a printed circuit board having solder paste printed thereon at a plurality of different temperatures in the vacuum; removing the first inert gas includes simultaneously heating an integrated circuit package on a printed circuit board having solder paste printed thereon at a plurality of different temperatures and replacing the second inert gas includes simultaneously cooling the integrated circuit package on the printed circuit board having solder thereon at a plurality of different temperatures; or moving an integrated circuit package on a printed circuit board in at least one direction of horizontally, vertically, and a combination thereof from replacing the air, removing the first inert gas, reflow soldering, providing the second inert gas, through replacing the second inert gas.

With regard to claim 7 and 17, these dependent claims depend from independent claims 6 and 16, respectively and are believed to be allowable since they contain all the limitations set forth in the independent claims from which they depend and claim additional unobvious combinations including: vacuum reflow soldering provides the integrated circuit package on the printed circuit board having solder bumps with 90% of the solder bumps formed having less than 10% empty voids and 10% of the solder bumps having less than 20% empty voids as a percentage of volume; or the reflow unit provides the integrated circuit package on the printed circuit board having solder bumps with 90% of the solder bumps formed having less than 10% empty voids and 10% of the solder bumps having less than 20% empty voids as a percentage of volume.

Further, the Examiner states in the Third Office Action:

“Mitten teaches... As the soldering is performed in a vacuum, the apparatus is capable of forming solder bumps with very low void volumes. Although the reference teaches soldering of a circuit board, it is noted that the object soldered does not further limit the apparatus.”

Applicants respectfully disagree. The Mitten brazing is performed in an inert gas as indicated in Mitten paragraph 56:

“[0056] ... Simultaneously, the vessel chamber is pressurized by the heating of the inert gas with occasional injection of additional argon gas as necessary. The temperature and pressure are continuously increased until the desired temperature and pressure conditions for brazing the workpiece W are reached. The preferred temperature and pressure will depend on the size of the workpiece and the type of material or materials that are being brazed. The workpiece is maintained at the brazing temperature and pressure for a time sufficient to ensure thorough heating of the workpiece.”

Regarding claims 8-10, these dependent claims depend from independent claim 6 and are believed to be allowable since they contain all the limitations set forth in the independent claim from which they depend and claim additional unobvious combinations including: vacuum reflow soldering comprises heating around an integrated circuit package on a printed circuit board having solder paste printed thereon at a plurality of different temperatures in the vacuum; or removing the first inert gas includes simultaneously heating the integrated circuit package on the printed circuit board having solder paste printed thereon at a plurality of different temperatures and replacing the second inert gas includes simultaneously cooling the integrated circuit package on the printed circuit board having solder thereon at a plurality of different temperatures in the unloading unit after moving the integrated circuit package on the printed circuit board in the first move; or moving the integrated circuit package on the printed circuit board in at least one direction of horizontal, vertical, and a combination thereof.

Based on all of the above, it is respectfully submitted that claims 1-10 and 17 are allowable under 35 U.S.C. §102(b) as not being anticipated by Mitten because of *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co., supra*.

Regarding claims 11-12, 14-16, and 18-19, Applicants respectfully traverse the rejections since the Applicants' claimed combination, as exemplified in claim 11, includes the limitations not disclosed in Mitten of:

“a loading lock for replacing air with a first inert gas and for removing the first inert gas to form a vacuum around the integrated circuit package on the printed

circuit board, the loading lock for filling the vacuum with air, the first inert gas, or a second inert gas after removing the integrated circuit package on the printed circuit board;
an unloading lock for providing the second inert gas to fill the vacuum and for replacing the second inert gas with air around the integrated circuit package on the printed circuit board, the unloading lock for filling the vacuum with air, the first inert gas, or the second inert gas after removing the integrated circuit package on the printed circuit board.”

The Examiner states in the Office Action:

“Mitten teaches a system [with]... loading locks (doors 21,22)”
[insertion and deletion for clarity]

It is respectfully submitted that a fundamental principle contained in 35 U.S.C. 112, second paragraph is that applicants are their own lexicographers and the terms loading and unloading locks are defined in Specification page 7, line 4, and page 8, line 1, respectively. Thus, the Mitten doors 21 and 22 would not anticipate the claimed locks.

Regarding claims 15, Applicants respectfully traverse the rejections since the Applicants’ claimed combination, as exemplified in claim 15, includes the limitations not disclosed in Mitten of:

“a conveyor system for moving the part among the loading lock, the reflow unit, and the unloading lock.”

Mitten has a table that does not move the part among a loading lock, a reflow unit, and a unloading lock.

Regarding claim 20, this dependent claim depends from independent claim 16 and is believed to be allowable since it contains all the limitations set forth in the independent claim from which it depends and claims additional unobvious combinations including: a conveyor system for moving in horizontal, vertical, and a combination thereof the integrated circuit package on the printed circuit board.

Based on all of the above, it is respectfully submitted that claims 1-20 are allowable under 35 U.S.C. 102(e) as not being anticipated by Mitten because:

“A claim is anticipated only if each and every element *as set forth in the claim* is found, either expressly or inherently described, in a single prior art reference. (Kalman v Kimberley Clark Corp., 713 Fed. 2nd 760, 771, 218 USPQ 781, 789 (Fed. Circ. 1983), *Cert. Denied*, 465 U.S. 1026, 224 USPQ 520, 1984.)” [emphasis in original]

The other references cited by the Examiner showing the prior art have been considered and are not believed to disclose, teach, or suggest, either singularly or in combination, Applicants' invention as claimed.

Response to Arguments

The Examiner stated that Applicant's arguments with respect to claims 4, 9, and 11-20 have been considered but are moot in view of the new grounds of rejection.

It is respectfully submitted that the new grounds of rejection of claims 4, 9, and 11-20 have been traversed above.

The Examiner states in the Third Office Action:

“In response to applicant's argument that Schmatz does not disclose using a vacuum or inert gas as claimed, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

Schmatz teaches a vacuum system comprising a pump capable of removing air and a backfill gas system capable of replacing air (col 6 lines 31-65). This removal of air is capable of reducing void formation. It is noted that the claims refer to a system not a method or process.”

Applicants respectfully disagree. By reference to Schmatz FIG. 1, it may be seen that Schmatz has only one chamber 11. Therefore, it cannot have loading and unloading locks and a reflow unit. Based on the above, it is respectfully submitted that Schmatz does not anticipate claims 1-20 under 35 U.S.C. §102(b) because the Examiner's above reading of the claims is by the double inclusion of elements, i.e. reading a claimed element on the three

different elements in the reference. This renders the Examiner's reading indefinite and not anticipatory under *Ex parte* Kristensen, 10 USPQ2d 1701 (Bd. Pat. App. & Inter. 1989).

Conclusion

In view of the above, it is submitted that the claims are in condition for allowance and reconsideration of the rejections is respectfully requested. Allowance of claims 1-20 at an early date is solicited.

The Applicants appreciate the Examiner's hard work and diligence in doing a thorough job in searching this application, but this is the third non-final Official Action on this case and Applicants would like to remind the Examiner that MPEP § 904.02 strongly encourages the Examiner to perform one thorough search instead of many less-than-thorough searches.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including any extension of time fees, to Deposit Account No. 50-0374 and please credit any excess fees to such deposit account.

Respectfully submitted,



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